DOCUMENT RESUME

ED 365 513 SE 053 803

AUTHOR	Stedman, James B.
TITLE	Eisenhower Mathematics and Science Education Act: Overview and Issues for Reauthorization. CRS Report for Congress.
INSTITUTION	Library of Congress, Washington, D.C. Congressional Research Service.
REPORT NO	CRS-93-5-EPW
PUB DATE	17 Dec 92
NOTE	20p.
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Elementary Secondary Education; Federal Aid; *Federal Legislation; *Federal Programs; Grants; Mathematics Achievement; *Mathematics Education; *National Programs; *Science Education
IDENTIFIERS	*Dwight D Eisenhower Math and Science Educ Program; Reauthorization Legislation; Science Achievement

ABSTRACT

Legislative authority for the Dwight D. Eisenhower Mathematics and Science Education Act, one of the principal sources of Federal funding to improve mathematics and science instruction in elementary and secondary schools, expires during the 103d Congress. This report provides background data and analysis for the reauthorization of the Eisenhower Act. It reviews the general concerns about mathematics and science performance that may affect this reauthorization, as well as those related issues involving National Education Goals, standards, and assessments left unresolved by the 102d Congress. Included are overviews of the current provisions of the Act, its funding, and major findings from recent evaluations and studies. A concluding section analyzes some of the significant questions that may be considered during this reauthorization: (1) funding shifts from local education agencies to state education agencies and institutes of higher education, (2) training duration required of local education agencies, (3) the extent to which Eisenhower funds should be directed to broad mathematics and science reform efforts, (4) the use of Eisenhower funds to support educational reform beyond mathematics and science education, (5) the needs of underrepresented and underserved populations served by Eisenhower activities, and (6) legislative changes needed to improve the administration of Eisenhower funds. (MDH)

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CRS Report for Congress

ED 365 513

Eisenhower Mathematics and Science Education Act: Overview and Issues for Reauthorization

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SE 053 803

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EISENHOWER MATHEMATICS AND SCIENCE EDUCATION ACT: OVERVIEW AND ISSUES FOR REAUTHORIZATION

SUMMARY

The Dwight D. Eisenhower Mathematics and Science Education Act, one of the Federal Government's principal sources of funding for improving mathematics and science instruction in elementary and secondary schools, will be considered for reauthorization by the 103d Congress. Legislative debate on this Act is likely to be influenced by concern that low levels of math and science achievement adversely affect the country's economic health. This and related concerns are reflected in the National Education Goals, and in major efforts to establish national standards for math and science curricula and national assessments to measure progress in these areas.

The Eisenhower Act, administered by the U.S. Department of Education, is funded in FY 1993 at $275.5 million. Approximately 89 percent of Eisenhower Act funds are awarded to States by formula for use by State educational agencies, local educational agencies, and higher education institutions to provide training to improve math and science instruction. Most of these funds are allocated among local educational agencies by formula. Discretionary grants to programs of national significance (6 percent of annual appropriations) have supported development of national curriculum standards, among other projects. Among the national program grants is funding for a national clearinghouse for science, mathematics, and technology education materials. Regional math and science education consortia (5 percent of annual appropriations) provide technical assistance to classroom teachers.

Findings from recent evaluations and reports on the Eisenhower Act include the following: programs funded by the Act may reach one-third of all math and science teachers and nearly all school districts; much of the local educational agencies' activities are short-term and of "low-intensity"; activities conducted by higher education institutions may have more effect on actual classroom practice; national program activities may support math and science reform more than other Eisenhower activities; and, the U.S. Department of Education's administration and oversight of the Act appears limited and deficient.

Some of the key questions that are likely to be considered during reauthorization include the following: should more Eisenhower funds be directed to State educational agencies and higher education institutions? should local educational agencies be required to provide training of a specific duration? to what extent should Eisenhower funding be focused on broad math and science reform efforts? should reform beyond math and science education be supported under this program? are underrepresented populations being served? and, are legislative changes needed to improve the Department of Education's oversight and administration of the Act?

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EISENHOWER MATHEMATICS AND SCIENCE EDUCATION ACT: OVERVIEW AND ISSUES FOR REAUTHORIZATION

INTRODUCTION

Legislative authority for the Dwight D. Eisenhower Mathematics and Science Education Act, one of the principal sources of Federal funding to improve math and science instruction in elementary and secondary schools, expires during the 103d Congress.[1] Congressional debate over its reauthorization is likely to be influenced by the widespread concern that the achievement of United States elementary and secondary school students in math and science is poor, comparing unfavorably to achievement in these subjects in other countries. Specific questions about the effectiveness of the programs and projects supported by the Eisenhower Act presumably will be raised, as well.

This report provides background data and analysis for the reauthorization of the Eisenhower Act by the 103d Congress. It reviews the general concerns about math and science performance that may affect this reauthorization, as well as those related issues involving National Education Goals, standards, and assessments left unresolved by the 102d Congress. This is followed by overviews of the current provisions of the Act, its funding, and major findings from recent evaluations and studies. A concluding section analyzes some of the significant questions that may be considered during this reauthorization.

MATH AND SCIENCE PERFORMANCE AND REFORM[2]

Among the forces sparking math and science education reform efforts at Federal, State, and local levels is concern that current, low levels of achievement among elementary and secondary school students have negative consequences

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[1]The Eisenhower Act is presently authorized by title II, part A of the Elementary and Secondary Education Act of 1965 (P.L. 89-10), as amended. The original authority for the Eisenhower activities was title II of the Education for Economic Security Act (P.L. 98-377), enacted in 1984. The Augustus F. Hawkins-Robert T. Stafford Elementary and Secondary School Improvement Amendments of 1988 (P.L. 100-297) repealed this authority, reestablishing it in the Elementary and Secondary Education Act as the Dwight D. Eisenhower Mathematics and Science Education Act.

[2]For an expanded discussion of the issues covered in this section and citations to relevant studies, see U.S. Library of Congress. Congressional Research Service. *Improving Precollege Mathematics and Science Achievement: Selected Policy Issues for the Federal Government*. CRS Report for Congress No. 92-606 EPW, by James B. Stedman. Washington, 1992 (Hereafter referred to as *Improving Precollege Mathematics and Science Achievement*); and U.S. Library of Congress. Congressional Research Service. *National Education Goals and Federal Policy issues: Action by the 102d Congress*. CRS Report for Congress No. 92-884 EPW, by James B. Stedman and Wayne C. Riddle. Washington, 1992.

for the economic health of the Nation. International comparisons show that students in many developed countries significantly outpace United States students in math and science. Further, there is evidence that students in this country lose interest in pursuing math and science careers the longer they are in school, and, that few complete advanced courses in these disciplines during their high school years.

Interest in improving math and science achievement is manifest in the National Education Goals, adopted in 1990 by President Bush and the Nation's Governors. Goal #3 states that, by the year 2000, 4th, 8th, and 12th graders will demonstrate competency in challenging subject matter, including math and science. Goal #4 states that, by the year 2000, U.S. students will be first in the world in math and science achievement.

Broad-based reform efforts are underway to improve math and science education. The National Council of Teachers of Mathematics has developed national standards that identify the important knowledge and skills students should acquire from a reformed mathematics curriculum. These standards are now influencing formation of State level curriculum standards, mathematics curriculum, and assessments of students' mathematical achievement. Development of comparable science education standards is underway. The National Academy of Sciences has established a National Committee for Science Education Standards and Assessment to develop these standards, which are due to be released in 1994. Other efforts include the American Association for the Advancement of Science's *Project 2061* which is supporting several demonstration projects to develop the processes and materials necessary to improve math, science, and technology education. The National Science Teachers Association, through its *Scope, Sequence, and Coordination of Secondary Science*, is exploring the restructuring of how and when the different scientific disciplines should be taught to students.

The national reform efforts and interests highlighted above will influence the reauthorization of the Eisenhower Act. Further, the 101st and 102d Congresses sought to identify the most appropriate reform strategies that would help accomplish the National Education Goals and to define Federal and congressional roles in the efforts of setting standards and developing assessments. Major legislation developed in both Congresses failed to be enacted, leaving these issues for continued debate by the 103d Congress.

EISENHOWER ACT: PROVISIONS, FUNDING, AND STATUS

The Eisenhower Mathematics and Science Education Act is focused on improving math and science instruction in the Nation's elementary and secondary skills. This Act, administered by the U.S. Department of Education (ED), has three major components: formula grants to States, discretionary grants awarded by ED to projects of national importance, and grants for

regional math and science education consortia.[3] Aggregate funding for FY 1993 is $275.5 million, of which $248 million or 89 percent is for the State grants; $15.9 million or 6 percent is for national programs (includes funds for a national clearinghouse which is discussed below);[4] and $13.6 million or 5 percent is for the regional consortia. From the aggregate appropriation for State grants and national programs, up to one-half of one percent is for the outlying areas and one-half of one percent is for Indian schools run by the Secretary of the Interior.

Each of the components of the Eisenhower Act is described below. The annual appropriations for the Eisenhower activities and recent evaluations of the Act are also considered in separate subsections below.

Provisions

State Grants

The State and sub-State allocation of Eisenhower State grant funds is shown in the chart below. Acronyms used in the chart and in subsequent text are: LEAs for local educational agencies; SEAs for State educational agencies; IHEs for institutions of higher education; and SAHEs for State agencies for higher education.

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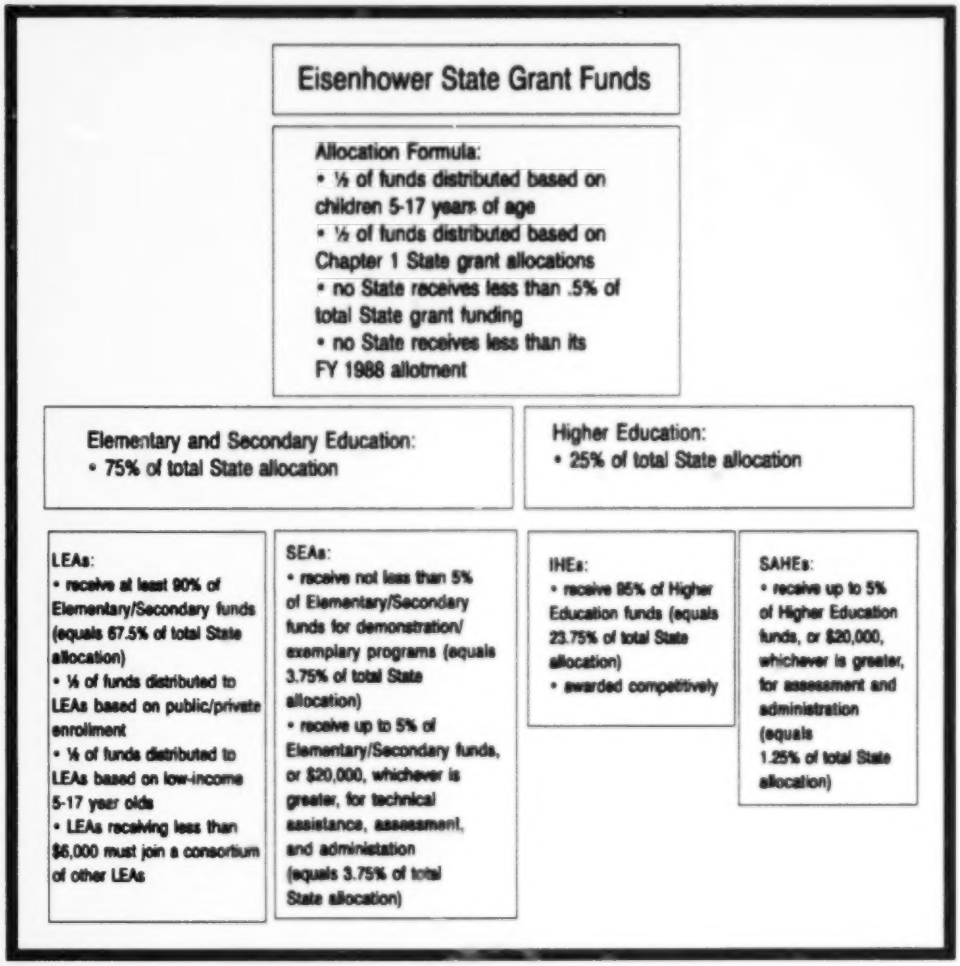
[3]The title for the subpart authorizing these consortia refers to them as Regional Mathematics and Science Education Consortiums.

[4]Although the authorizing statute states that 4 percent of the annual appropriation for the State grants and national program grants is for the national grants, annual appropriations acts have provided a somewhat larger percentage for these grants.

Chart 1.


Eisenhower State Grant Funds
Allocation Formula:
• ½ of funds distributed based on children 5-17 years of age
• ½ of funds distributed based on Chapter 1 State grant allocations
• no State receives less than .5% of total State grant funding
• no State receives less than its FY 1988 allotment
Elementary and Secondary Education:
• 75% of total State allocation
Higher Education:
• 25% of total State allocation
LEAs:
• receive at least 90% of Elementary/Secondary funds (equals 67.5% of total State allocation)
• ½ of funds distributed to LEAs based on public/private enrollment
• ½ of funds distributed to LEAs based on low-income 5-17 year olds
• LEAs receiving less than $6,000 must join a consortium of other LEAs
SEAs:
• receive not less than 5% of Elementary/Secondary funds for demonstration/ exemplary programs (equals 3.75% of total State allocation)
• receive up to 5% of Elementary/Secondary funds, or $20,000, whichever is greater, for technical assistance, assessment, and administation (equals 3.75% of total State allocation)
IHEs:
• receive 95% of Higher Education funds (equals 23.75% of total State allocation)
• awarded competitively
SAHEs:
• receive up to 5% of Higher Education funds, or $20,000, whichever is greater, for assessment and administration (equals 1.25% of total State allocation)

LEAs must use their funding for the following activities:

- preservice, inservice, and retraining assistance for current and prospective math and science teachers;
- recruitment or retraining of minority teachers to teach in these fields;
- training in the instructional uses of telecommunications technology, including computers and video devices, as part of a math or science curriculum (purchase of such equipment is permitted for schools with enrollments that are 50 percent or more poor, if their other math and science teacher training needs have been met);
- projects adding instruction in analytical and problem-solving skills to math and science curricula; or

- projects conducted by individual teachers to strengthen their skills or enhance instructional materials.

LEAs may conduct these activities under agreements with public agencies, private businesses, IHEs, and nonprofit organizations (e.g., museums), among other entities. LEAs must assure that these activities take into account the needs of groups underrepresented in math and science programs and careers. These groups include women, minorities, individuals with limited English proficiency (LEP), the disabled, migrants, and, in particular, gifted and talented children in such groups.[5]

Not more than 5 percent of an LEA's Eisenhower funding can be used for local administration. Also, beginning after FY 1990, an LEA receiving more funding that it did for FY 1990 must use the excess amount to train math and science teachers in elementary and middle schools. The Secretary of Education may waive this requirement if an LEA shows that training needs at these levels are already being met.

SEAs must use at least half of the funds set aside for SEA use for **demonstration and exemplary programs** addressing the following:

- teacher training, retraining, and inservice assistance;
- instructional equipment, materials, and technical assistance;
- underrepresented populations and the gifted and talented; or
- information dissemination concerning exemplary programs.

Special consideration has to be given to programs serving underrepresented and underserved populations.

Eisenhower State grants for **higher education** activities are awarded by SAHEs to IHEs for:

- traineeships for persons who will teach high school math or science;
- retraining of high school teachers to teach math or science; and
- inservice training to improve math and science teaching skills.

These activities must involve LEAs. IHEs must provide assurances that these programs will reflect the need to increase representation of underrepresented and underserved groups in math and science careers. SAHEs may award a portion of higher education funding to cooperative programs among LEAs, SEAs, private industry, and nonprofit organizations.

The Act provides for the participation of **private school children and teachers** in these programs. Such participation must be "equitable," in terms of the number of children in individual LEAs or statewide enrolled in private, nonprofit schools.

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[5]Unless otherwise noted, the Eisenhower Act identifies these **groups** as "underrepresented" or "underserved."

National Programs

The Secretary of Education makes grants or enters into cooperative arrangements to support programs of national significance in math and science instruction. Special consideration must be given to programs especially serving underrepresented and underserved groups, and to programs of training and retraining focused on scientific inquiry.

Two specific projects are authorized as national programs.[6] In consultation with the Director of the National Science Foundation (NSF), the Secretary of Education is authorized to support a **National Clearinghouse for Science, Mathematics, and Technology Education Materials**. The Clearinghouse is to:

- serve as a repository of math and science instructional materials for use by regional consortia (see below);
- compile information on all math and science education programs administered by Federal agencies;
- disseminate information, programs, and materials; and
- coordinate with databases containing math and science education materials.

A contract for establishment of the Clearinghouse was recently awarded.

In addition, the statute authorizes grants to **model programs for instruction and training in the use of computers**. These grants can meet up to half of the costs of each model program; priority is given to programs that could be implemented nationally, show commitment of local groups, include teacher training, build higher order skills into the math and science curriculum, and use interactive technology. ED has not used this specific authority.

Regional Consortia[7]

In consultation with the Director of the NSF, the Secretary of Education is authorized to support math and science consortia in the ED regions that will, among other activities:

- find and disseminate math and science education instructional materials, teaching methods, and assessment tools;

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[6]These were added to the Eisenhower Act by the Excellence in Mathematics, Science and Engineering Education Act of 1990 (P.L. 101-589).

[7]Ibid.

- assist classroom teachers and administrators in utilizing these materials, methods, and tools;
- train classroom teachers to instruct other teachers and administrators in the use of these materials, methods, and tools;
- conduct programs to meet the needs of underrepresented populations;
- develop and disseminate math and science materials for early childhood education; and
- if feasible, support computer networks linking regional consortia and the national clearinghouse.

Consortia must include organizations in their regions that address math and science education. Each entity funded to establish a consortium must create a regional board to identify program priorities and monitor administration of the consortium.

Grants or contracts for these consortia are to be made for up to 5 years. The Federal share of annual funding for each consortium is 80 percent in the first 2 years of funding, 75 percent in the third, 65 percent in the fourth, and 50 percent in the fifth. At the end of each award period, the Secretary of Education must report to the Congress on the effectiveness of each consortium. Funds for the initial establishment of the consortia were recently awarded to the regional laboratories supported by ED's Office of Educational Research and Improvement.

Funding

FY 1993 funding for the Eisenhower Act ($275.5 million) is more than 175 percent **greater** than the Act's initial funding in FY 1985. As figure 1 below shows, the aggregate appropriation for the Act has grown annually with two exceptions: a substantial reduction between FY 1985 and FY 1986, and a small decrease between FY 1989 and FY 1990. When annual funding is adjusted for the effects of inflation, the increase in Eisenhower assistance remains considerable, up by more than 100 percent between FY 1985 and FY 1993.

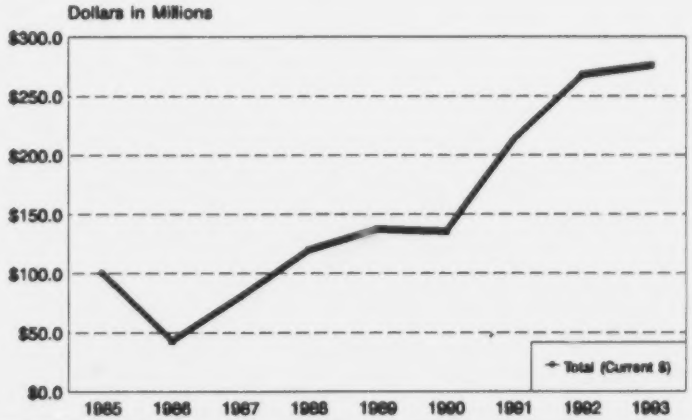
The Eisenhower Act contains two authorizations for appropriations through FY 1993: one for the State grant program and national program, and one for the regional consortia. Both authorizations were at a level of "such sums as may be necessary" for FY 1993. Annual appropriations acts have set separate appropriations levels for the State grant programs, the national programs, the national clearinghouse (indicating that it is included in the appropriation for the national programs), and the regional consortia. The national clearinghouse funding is **not** shown separately in the table portion of

figure 1, but is included in the national programs amounts for FY 1992 and FY 1993 (clearinghouse: $3.5 million and $3.472 million, respectively).

Data in the table included in figure 1 also show that in FY 1993 approximately 89 percent of Eisenhower Act funds are to be awarded under the State grant program; 6 percent are for national program grants; and 5 percent are for regional math and science consortia. Funding for national program grants made up a substantially larger percentage of total funds when the statutory authority was in the Education for Economic Security Act (pre-FY 1989 appropriation). Under this authority, the national programs were to receive between 9 and 10 percent of the aggregate appropriation.[8] The repeal and reauthorization of these programs as the Eisenhower Act in 1988 reduced the reservation for national program to 4 percent. Nevertheless, appropriations acts in recent years have directed a somewhat higher percentage (between 5 and 7 percent) of the State grant and national program grant appropriation to national programs.

Figure 1.

EISENHOWER MATHEMATICS AND SCIENCE EDUCATION ACT
FUNDING FOR FY 1985 THROUGH FY 1993



	1985	1986	1987	1988	1989	1990	1991	1992	1993
Total (Current $)	$100.0	$43.1	$80.0	$110.7	$137.3	$135.8	$213.7	$268.0	$275.5
State Grant Programs	$90.1	$39.2	$72.8	$100.9	$128.4	$126.8	$202.0	$240.0	$246.0
National Programs	$9.9	$3.9	$7.2	$10.8	$8.9	$8.9	$11.7	$16.0	$15.9
Regional Consortia								$12.0	$13.6

Table prepared by the Congressional Research Service.

[8] As originally enacted, the legislation reserved 10 percent for national programs. Amendments in 1986 reduced that to 9 percent.

Status

The findings identified below are derived from several recent evaluations and reports that focused solely, or in part, on the Eisenhower Act.[9] Most concentrated on the status and impact of the State grant program. The national clearinghouse and the regional consortia are too new to have been evaluated. The sources for each finding below are given in parentheses (acronyms are defined in footnote 9).

- **The reach of the Act is very broad.**

In 1988-89, approximately one-third of all elementary and secondary school teachers with responsibility for teaching math or science participated in an Eisenhower-funded, State grant activity (SRI). Nearly all school districts participate in the State grant program (SRI, GAO).[10] Approximately one-fifth of all IHEs conducted Eisenhower activities at some point during the first 4 years of State grant funding (SRI).

- **The Act supports SEA leadership roles in math and science education improvement.**

Funds reserved for SEA activities (demonstration and exemplary projects) in the State grant program contribute important resources in support of SEA leadership activities for math and science reform; on average, in 1988-89, these Eisenhower funds reserved for SEAs constituted **half** of all discretionary funds SEAs had for reform of math and science education (SRI).

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[9]U.S. General Accounting Office. *The Eisenhower Math and Science State Grant Program.* Report to the Chairman, Subcommittee on Elementary, Secondary, and Vocational Education, Committee on Education and Labor. GAO/HRD-93-25. Washington, 1992 (referred to in the text of this CRS report as GAO); SRI International. *The Eisenhower Mathematics and Science Education Program: An Enabling Resource for Reform.* Summary Report. Prepared under contract for the U.S. Department of Education. Washington, 1991 (referred to as SRI); Carnegie Commission on Science, Technology, and Government. *In The National Interest: The Federal Government in the Reform of K-12 Math and Science Education.* New York, 1991 (referred to as Carnegie); U.S. Department of Education. Office of Inspector General, Region V. *Improvements Needed to Assure the Eisenhower Mathematics and Science Education Program Meets the Objectives of National Education Goal Number 4 and the Eisenhower Act.* Management Improvement Report No. 92-09, May 19, 1992 (referred to as IG).

[10]These two sources provide somewhat conflicting data for 2 consecutive school years. Based on a sample of 10 percent of all districts, SRI estimated that, nationwide, 93 percent of all districts participated in the 1988-89 school year. GAO, relying on data supplied by all States, concluded that the participation rate in 1989-1990 was 83 percent. The change from 1 year to the next described here may result from the different sources of data used, not actual changes in participation. Reportedly, districts eligible for small grants were likely to be nonparticipants. With the substantial increase in funding for the State grant program in recent years, this may not be a significant stumbling block for participation.

- **Much of the LEA activity supported by Eisenhower funding is of short duration and "low-intensity."**

LEA activities, under the State grant program, are typically brief endeavors that are not part of a sustained sequence of events for individual teachers; the duration of **annual** Eisenhower training for each participating teacher has averaged 1 day (6 hours) or less and, at the LEA level, averaged $30 per participating teacher in 1988-89 (SRI, GAO). Some analyses of LEA activities have concluded that they have not contributed to math and science education reform (Carnegie); others report that some degree of flexible, LEA-based activities may serve a useful function by raising **many** teachers' awareness of broader reform efforts (SRI, GAO).

- **The Eisenhower activities conducted by IHEs appear to be more sustained and may be more effective for certain purposes.**

In the 1987-88 and 1988-89 school years, IHE training annually averaged 60 hours for each participating teacher and was viewed, by SRI, as "more likely to have impact on classroom practice" (SRI).

- **National program funds may contribute more to overall math and science reform than many other Eisenhower activities.**

LEA funds are awarded without real competition or monitoring of outcomes; the national program "has better mechanisms for review and accountability and a better record of attention to reform" (Carnegie).

- **The Act's impact on reform of math and science education appears dependent upon prior commitment to reform and other factors.**

The effects of State grant funds on math and science education reform appear to depend upon the degree to which "well-formed agendas" for such reform are already in place; the level of available funding; the preponderance of low-intensity LEA-funded training; and other factors not addressed by the Act, such as salary levels and the quality of available facilities (SRI).

- **ED's monitoring of Eisenhower projects, collection of data from States, and evaluation of the effectiveness of Eisenhower State grant funding appear limited and deficient.**

The first statutorily required annual reports from SEAs and SAHEs concerning use of Eisenhower funds (for the 1989-1990 school year) were scheduled to be submitted to ED at the end of 1990; several reports were missing as of June 1992 and the data contained in others were "not responsive to Education's questions" (GAO). Although a summary by ED of these reports must be submitted to the Congress every 2 years, ED has not analyzed the State reports already filed and may not be receiving sound information to prepare

such summaries (GAO, IG). The information submitted on State applications for funding in the State grant program has been judged to be inadequate for determining the merit of proposed projects (IG). Although ED reportedly seeks to conduct on-site monitoring of each State every 3 years, some 19 States have not been visited in more than 4 years (IG).

REAUTHORIZATION QUESTIONS

This concluding section briefly reviews several of the key questions likely to be considered during the reauthorization of the Eisenhower Act. Many of these were raised in the evaluations and reports discussed above. Each of these questions below, with the exception of the last (focused on ED's administration), reflects different aspects of an overarching issue: **the role that Eisenhower funds should play in reforming math and science education and instruction.**

- **Should Eisenhower State program funds be shifted from LEAs to SEAs and IHEs?**

Concern about the impact of the short-term, LEA-based training that dominates the State grant program has generated proposals to modify the current distribution of State grant funds in favor of SEAs and IHEs. (As chart 1 above shows, over two-thirds of State grant funds are awarded to LEAs.) Given the different kinds of activities conducted by the several groups of entities funded by the State grant program, such proposals would increase spending on exemplary and demonstration projects and long-term IHE training. In its evaluation, SRI proposed such a modification in the relative balance in Eisenhower State grant funding. One example offered by SRI was to cap the LEA share at 50 percent, and raise the IHE and SEA shares to 30 percent and 20 percent respectively.[11] This redirection of funds, SRI argued, would increase support for State leadership activities, such as development of State curriculum standards, and offer teachers more sustained training activities.

As has already been suggested in the review of evaluation findings, there are several arguments favoring maintenance of a substantial level of Eisenhower LEA funding. Such funding clearly reaches a large number and percentage of the teachers who have math and science responsibilities, primarily because the funds are distributed among nearly all LEAs and used to support activities for many teachers in individual LEAs. As a result, LEA funding appears to serve a basic, necessary function of informing most of the profession as to the broader reform activities underway. Finally, as currently authorized, LEA funding offers sufficient flexibility so that some LEAs do more than short-term training with their funds. Proponents of moving more State grant funding toward broader reform activities assert that the short-term nature of most LEA activities precludes them from having any substantial impact on classroom practice

[11]Under the current allocation process, the LEA share of total State Eisenhower funding is 67.5 percent, the IHE share is 23.75 percent, and the aggregate SEA share is 7.5 percent. These percentages are given in parentheses in chart 1 above.

(discussed further below); and projects supported by other Eisenhower programs have been substantially more related to reform (see findings above).

These two perspectives may be addressed through a two-stage process for the State grant program. As a substantial percentage of a State's teachers complete their participation in short-term, awareness-building activities run by LEAs, funding might shift toward longer-term activities conducted by IHEs, SEAs, and LEAs. This might be accomplished through shifts in the allocations among the different entities active in this program, or by requiring these entities to direct more of their current share of funds to longer-term activities.

- **Should LEAs be required to provide training of a specific duration?**

This question is closely related to the preceding one. The benefits of long-term training are debated. In their evaluations, SRI and GAO suggested that longer term training activities were more likely to influence classroom practice than was short-term training. ED's response to the GAO report stated that the trade-offs between short-term and long-term training are complex and that there was no consensus on which was preferable.[12]

Further, there is concern about how requirements that LEA activities be of a specific duration would affect both local flexibility to shape activities to meet local needs, as well as the extent to which the LEA program reaches a large portion of the math and science teaching force. Although SRI recommended moving some funds to IHEs in order to increase the amount of long-term training supported by Eisenhower funds, it did **not** recommend that ED **require** LEAs to offer only longer term training. It called on ED to "encourage" the States to request or mandate that LEAs fund **more** longer term training. In its interviews and surveys, GAO found local resistance to mandating that LEA-level training be of a specified duration.

Nevertheless, ED took a limited step recently toward requiring training of longer duration. In May 1992, it amended Eisenhower State program regulations to require SEAs and LEAs to describe in their applications what they will do to guarantee that training programs "are of high quality and of sufficient duration to promote a lasting and positive effect on teacher performance."[13]

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[12]GAO, *Eisenhower Math and Science State Grant Program*, p. 28. ED's response is in the form of a letter reprinted in the report from John T. MacDonald, Assistant Secretary for Elementary and Secondary Education. Letter to Clarence C. Crawford, Associate Director, Education and Employment Issues, Sept. 21, 1992.

[13]U.S. Department of Education. Eisenhower Mathematics and Science Education--State Grant Program. *Federal Register*, May 21, 1992. p. 21710. In addition, ED proposed FY 1993 appropriations language that would have required IHE activities funded by Eisenhower State grant funds to "provide each participant [teacher] with no fewer than 20 days of training." This requirement was **not** included in the final appropriations statute.

- **To what extent should Eisenhower funding be directed to broad math and science reform efforts, such as curriculum standard setting and curriculum development?**

In recent years, ED has used Eisenhower national program funds to further broad reform of math and science curricula. For example, Eisenhower national program funds have been awarded to the National Academy of Sciences for the development of national standards for science curriculum. Further, ED has announced that priority consideration for national program funds is being given to those State applicants seeking to develop State curriculum frameworks in mathematics and science, and to establish guidelines for teacher development linked to those frameworks.[14]

Expansion of such use of Eisenhower assistance has been proposed. The Carnegie report recommended that the State grant program be substantially modified to resemble the national program by making it a competitive grant program. GAO reported that such a proposal raised concern among some educators that funds would flow to the localities able to prepare the best grant proposals, not those with the greatest needs or best projects.

There is no single response to the question posed above. It is problematic that one could strike a perfect balance between (1) addressing the preservice and inservice training needs of teachers and (2) furthering the development and implementation of State and national curriculum standards, curriculum, and assessments. Each contributes to improvement of math and science education and instruction. It may be argued that, to be effective, training must be informed by broader math and science reform; and, for broad reform to take hold, it must be coupled with substantial teacher training.

It might also be considered whether authorized LEA activities should be broadened to include more than training for instructional improvement. Authorized activities might be expanded to include some related uses of funds, such as the acquisition or improvement of instructional equipment and materials by all districts. The statute might also be amended to require that all LEA, IHE, and SEA activities be linked to State and national curriculum standards and other State and national reform activities in math and science. This latter proposal need not change the general kinds of activities that LEAs, IHEs, and SEAs undertake. For example, LEAs might still be limited to training activities, but these could be required to address broader reform efforts.

Finally, during this reauthorization, the Congress might review how closely the Eisenhower activities have been coordinated with other math and science education activities underway in other ED programs and in other Federal agencies. Provisions of the Eisenhower Act look to coordination of these activities. For example, State applications must describe how Eisenhower funds

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[14]Curriculum frameworks identify broad goals, structure, and content for different disciplines. The Eisenhower national program priority is delineated in the *Federal Register* for July 29, 1992, p. 33602-33604.

will be coordinated with funds from other Federal agencies (NSF and the Department of Energy are cited specifically).

- **Should Eisenhower funds support educational reform beyond math and science education?**

Reportedly, such broadening of the Eisenhower focus has been suggested.[15] The appropriateness of permitting Eisenhower funds to address reform in areas other than math and science is sure to be debated, as it has been before. The prior math and science education program, authorized by title II of the Education for Economic Security Act, authorized support for math, science, **computer learning, and foreign languages**. The 1988 Hawkins-Stafford reauthorization legislation deleted computer learning (except under very restricted circumstances) and foreign language, because greater funding was needed for math and science education, and these other fields could be supported under different programs.[16]

Among the strongest reasons for limiting this funding to improvement of math and science instruction is the current development and implementation of new math and science curriculum standards. As these standards take hold, they are likely to reform math and science education in substantial ways, increasing the need for preservice and inservice training of the math and science teaching force. A countervailing argument is that staff development needs beyond math and science are also likely to grow as standards are established in other disciplines, and States and localities should have flexibility to address these needs.

- **Are the needs of underrepresented and underserved populations being served by Eisenhower activities?**

As has been delineated, LEAs and IHEs receiving State grant funding must address the needs of these populations. A similar requirement is imposed on the national program funds administered by ED. There is some evidence that these needs have not been a significant priority of Eisenhower grantees. SRI reported that, in 1988-89, only 13 percent of LEAs, 25 percent of IHEs, and 18 percent of SEA demonstration and exemplary projects had made service to these populations an explicit component of their activities. SRI did note that the allocation formulas are likely to direct more Eisenhower funds to States and localities with substantial numbers of students from underrepresented and underserved populations. Further, SRI reported that, in the aggregate, disproportionately high percentages of IHE and LEA participants were minority

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[15]Allen, Gary. Eisenhower Reauthorization 1993. *Dwight D. Eisenhower Mathematics and Science Education Newsletter*. Consortium for Educational Equity, Rutgers University, Fall/Winter 1992.

[16]U.S. House. Committee on Education and Labor. *School Improvement Act of 1987*. Report to Accompany H.R. 5. House Report No. 100-95, 100th Cong., 1st Sess. Washington, GPO, 1987. p. 64.

teachers. Some may argue that the Act should require that greater levels of Eisenhower funding be devoted to serving the math and science needs of these populations, particularly because students from these groups show relatively low levels of math and science achievement.[17]

- **Are legislative changes needed to improve ED's administration and oversight of the Eisenhower Act?**

As described above, evaluations from GAO and ED's IG have been highly critical of ED's data gathering, monitoring of projects, and evaluation of applications. At least some of the criticisms raised in these reports may be addressed by ED, which, in response to these concerns, committed itself to improving its administration and oversight of the program. Further, neither report suggested that legislative action was necessary to remedy these problems. At a minimum, it might be appropriate during the reauthorization of the Eisenhower Act to scrutinize the extent to which ED has responded to the GAO and IG reports.

[17]See, *Improving Precollege Mathematics and Science Achievement.*